

and transfer of elements upon the chemical affinity of the substances present, experiments were made upon sulphuric acid in the following manner. Dilute sulphuric acid was prepared; its specific gravity was 1021.2. A solution of sulphate of soda was also prepared; of such strength that a measure of it contained exactly as much sulphuric acid as an equal measure of the diluted acid just referred to. A solution of pure soda, and another of pure ammonia, were likewise prepared, of such strengths that a measure of either should be exactly neutralised by a measure of the prepared sulphuric acid.

262. Four glass cups were then arranged, as in fig. 15; seventeen measures of the free sulphuric acid (261) were put into each of the vessels *a* and *b*, and seventeen measures of the solution of sulphate of soda into each of the vessels *A* and *B*. Asbestos, which had been well washed in acid, acted upon by

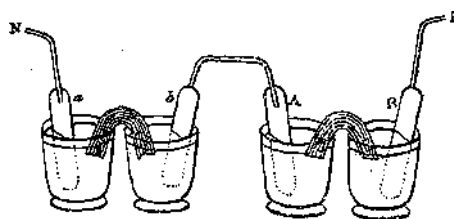


Fig. 15.

the voltaic pile, well washed in water, and dried by pressure, was used to connect *a* with *b* and *A* with *B*, the portions being as equal as they could be made in quantity, and cut as short as was consistent with their performing the part of effectual communications, *b* and *A* were connected by two platina plates or poles soldered to the extremities of one wire, and the cups *a* and *B* were by similar platina plates connected with a voltaic battery of forty pairs of plates four inches square, that in *a* being connected with the negative, and that in *B* with the positive pole. The battery, which was not powerfully charged, was retained in communication above half an hour. In this manner it was certain that the same electric current had passed through *a* *b* and *A* *B*, and that in each instance the same quantity and strength of acid had been submitted to its action, but in one case merely dissolved in water, and in the other dissolved and also combined with an alkali.

263. On breaking the connection with the battery, the por-